

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
(Chapter II of the Patent Cooperation Treaty)  
(PCT Article 36 and Rule 70)

REC'D 14 FEB 2006

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Applicant's or agent's file reference FP21092	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. <b>PCT/AU2005/000112</b>	International filing date ( <i>day/month/year</i> ) 31 January 2005	Priority date ( <i>day/month/year</i> ) 30 January 2004	
International Patent Classification (IPC) or national classification and IPC			
Applicant TECHNOLOGICAL RESOURCES PTY. LIMITED et al			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a. ☒ (*sent to the applicant and to the International Bureau*) a total of 2 sheets, as follows:
    - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b. ☐ (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 29 August 2005	Date of completion of this report
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>B. PREMARATNE</b> Telephone No. (02) 6283 2407

**Box No. I**      **Basis of the report**1. With regard to the **language**, this report is based on:☒ The international application in the language in which it was filed☐ A translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:☐ international search (under Rules 12.3(a) and 23.1 (b))☐ publication of the international application (under Rule 12.4(a))☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):☐ the international application as originally filed/furnished☒ the description:pages **1-19** as originally filed/furnished

pages\* received by this Authority on \_\_\_\_\_ with the letter of

pages\* received by this Authority on \_\_\_\_\_ with the letter of

☒ the claims:pages **20-24** as originally filed/furnished

pages\* as amended (together with any statement) under Article 19

pages\* **25, 26** received by this Authority on 30 November 2005 with the letter of 30 November 2005

pages\* received by this Authority on \_\_\_\_\_ with the letter of

☒ the drawings:pages **1/3-3/3** as originally filed/furnished

pages\* received by this Authority on \_\_\_\_\_ with the letter of

pages\* received by this Authority on \_\_\_\_\_ with the letter of

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.3. ☐ The amendments have resulted in the cancellation of:☐ the description, pages☐ the claims, Nos.☐ the drawings, sheets/figs☐ the sequence listing (*specify*):☐ any table(s) related to the sequence listing (*specify*):4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).☐ the description, pages☐ the claims, Nos.☐ the drawings, sheets/figs☐ the sequence listing (*specify*):☐ any table(s) related to the sequence listing (*specify*):

\* If item 4 applies, some or all of those sheets may be marked "superseded."

# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/AU2005/000112

**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims 1 – 38	YES
	Claims	NO
Inventive step (IS)	Claims 1 – 38	YES
	Claims	NO
Industrial applicability (IA)	Claims 1 – 38	YES
	Claims	NO

## 2. Citations and explanations (Rule 70.7)

**Claims 1-38 meet the criteria set forth in PCT Articles 33(2)-(4) for novelty, inventive step, and industrial applicability, because the prior art before the priority date of the present claims does not disclose or fairly suggest a steelmaking process as disclosed in the present claims. This steel making process has industrial applicability.**

34. The process defined in any one of claims 31 to 33 wherein the additional slag forming agent includes calcium oxide.

5 35. The process defined in any one of claims 24 to 34 wherein step (b) includes controlling conditions within the direct smelting vessel to smelt the ferrous feed material to iron in the bath and to substantially partition phosphorus to the slag.

10 36. The process defined in any one of claims 24 to 35 wherein step (b) includes controlling conditions within the direct smelting vessel to partition phosphorus to the slag by maintaining the slag in an oxidising condition  
15 whereby the partition ratio of phosphorus in the iron to phosphorus in the slag is at least 1:5.

20 37. The process defined in any one of claims 24 to 36 wherein step (b) includes controlling conditions within the direct smelting vessel to partition phosphorus to the slag by maintaining the slag temperature to be in the range of 1350 - 1450°C and the amount of FeO in the slag to be at least 3% by weight.

25 38. A steel making process that includes the steps of:

(a) producing molten steel and molten  
30 steelmaking slag in a steelmaking process in a steelmaking vessel, the steelmaking slag including iron units and flux units; and

(b) producing molten iron in a direct smelting  
35 process in a direct smelting vessel containing a molten bath of iron and slag by supplying iron ore or pre-treated iron ore and carbonaceous material to the direct smelting vessel as a part of the feed material requirements of the

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direct smelting process and using a substantial portion of  
the steelmaking slag from step (a) as another part of the  
feed material requirements for the direct smelting process  
and smelting the iron ore or pre-treated iron ore and iron  
5 units to produce molten iron.